

## Comments to the Ethylene Oxide SAB CAAC September 30, 2014

My name is Chris Kirman, a toxicologist with Summit Toxicology, with more than 20 years experience in human health risk assessment. I am an independent consultant, speaking on behalf of EO Panel of the American Chemistry Council.

**I would like to address Charge Question #1 on exposure lagging:** EPA asks in this Charge Question -- *"Please comment on whether the use of lagged exposure estimates in the derivation of cancer risk estimates and the selection of the lag periods used are clearly described and scientifically appropriate."*

I believe that EPA's assumption of a single, long lag term (15 years) for EO exposures and lymphoid cancers is not well supported (based solely on empirical support), and suggest the panel consider the following:

**1. Underlying biology:**

- a. Latencies differ for individual cancer types;
- b. Latencies for some individual cancer types can be much shorter than 15 years (some lymphomas as little as 2 years; some leukemias as little as 1.5 years)
- c. Assuming a 15-year latency ignores any potential role for EO in affecting late stages of disease (progression)

**2. Precedents from existing IRIS assessments:**

- In the IRIS assessments for benzene, 1,3-butadiene, and trichloroethylene, the inhalation unit risk is based upon epidemiology data for specific LH cancers using cumulative exposure (no exposure lag included).
- The IRIS assessment for coke ovens emissions appears to be the only assessment in which lagging exposure was explicitly considered when estimating cancer potency. The inhalation unit risk was calculated as the geometric mean of 4 different lag assumptions (0, 5, 10, 15 years) since *"it is not known which of the lag times is most representative of reality"*.

**3. The potential policy implications of using a non-zero lag:** potential for inequitable treatment of exposure for toxicity and exposure assessment components of risk assessment;

**I would also like to address Charge Question #5:** *“Please comment on the accuracy, objectivity, and transparency of the revised draft assessment...”*

I feel that additional but related Charge Questions should be asked since EO is data-rich, and its assessment is complex. Because of this complexity, transparency suffers. There is a 1500-fold difference between EPA’s unit risk value and the unit risk value published by Valdez-Flores et al. (2010). Why? The unit risk calculation for ethylene oxide is a multi-step process (at least 10), with a range of options available at each step. For the sake of transparency these steps, and the available options for each, should be outlined (a summary is being prepared and will be provided to the CAAC). For each step in the process, you should consider:

1. The MOA and underlying biological for each decisions;
2. If there are viable alternatives; and
3. The impact of alternative options on resulting unit risk.